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# Material Safety Data Sheet

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Chemicals PPG INDUSTRIES

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

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|---|---|
| Date: Janaury, 1981 | Edition: Fifth DPM 541 |
| Chemical Name and Synonyms: Trichloroethylene; trichloroethane CAS No.: 79-01-6 | Trade Name and Synonyms: Trichlor, Trichlorethylene |
| Chemical Family: Halogenated Hydrocarbons | Formula: $CHCl=CCl_2$ |
| DOT Shipping Name: trichloroethylene | DOT Hazard Class: ORM-A UN1710 (RQ 1000#/454kg) |

## SECTION 1 · PHYSICAL DATA

| Boiling Point @ 760 mm Hg: | Vapor Density (Air=1): | Specific Gravity ($H_2O$=1): | pH of Solutions: |
|---|---|---|---|
| 188°F | 4.54 | (20°/20°C) 1.465 | 6.7 to 7.5 |
| **Freezing/Melting Point:** | **Solubility (Weight % in Water):** | **Bulk Density:** | **Volume % Volatile:** |
| -123.5°F -86.4°C | 0.11 | @20°C 12.2 lbs./gal. | 100 |
| **Vapor Pressure:** | **Evaporation Rate** | **Heat of Solution:** | **Appearance and Odor:** Clear, colorless liquid with ether-like odor. |
| @20°C = 57.8mmHg | (ethyl ether=1): 0.28 | Not Applicable | |

## SECTION 2 · HAZARDOUS INGREDIENTS

| | % | Hazard Data |
|---|---|---|
| Trichloroethylene (Stabilized) | 100 | See Below |
| | | |
| | | |
| | | |

## SECTION 3 · FIRE AND EXPLOSION HAZARD DATA

| Flash Point °F (Method Used) | Flammable Limits in Air (% by Volume) | Extinguishing Media: |
|---|---|---|
| None when tested in accordance with DOT requirements. (See Below) | See Below LEL: 12.5 UEL: 90 | Water, dry chemicals or carbon dioxide. |

Special Fire Fighting Procedures: Fire fighters should wear NIOSH/MSHA pressure-demand, self-contained breathing apparatus for possible exposure to hydrogen chloride and possibly traces of phosgene.

Unusual Fire and Explosion Hazards: Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a spark, flame or high-intensity source of heat. This can occur at concentrations of approximately 12.5% and above by volume. Decomposition or burning can produce hydrogen chloride and possibly traces of phosgene.

## SECTION 4 · HEALTH HAZARD DATA

Permissible Exposure Limits (TLV): See Section 5

| **Toxicity Data** (1), (2) | **Classification (Poison, Irritant, Etc.)** |
|---|---|
| LCLoInhalation (rat) - 8,000 ppm/4 hour | Inhalation: Toxic |
| $LD_{50}$ Dermal | Skin/Eye: Liquid mildly irritating to skin; eye irritant. |
| $LD_{50}$ Ingestion (rat) - 4,900-7,000 mg/kg | Ingestion: Slightly to moderately toxic |
| Fish, $LC_{50}$ (Lethal Concentration) Not Determined | Aquatic: |

Human Exposure Information/Data: Unconfirmed data[1] exists which indicate that trichlorethylene by ingestion may be more toxic to humans than indicated by the available animal data. Such unconfirmed data report poisonings at doses as low as 50 mg/kg.

## 24-HOUR EMERGENCY ASSISTANCE: (304) 843-1300

## SECTION 5 · EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

Section 4 - Permissible Exposure Limits

Current OSHA permissible exposure limits (29CFR 1910.1000) are 100 ppm (8-hour TWA); 100-200 ppm periodic excursions are allowed providing 8-hour TWA is at or below 100 ppm; 200-300 ppm excursions allowed only for maximum of 5 minutes in any 2-hour period; 300 ppm maximum allowable concentration (must not be exceeded). PPG's internal permissible exposure limit is 100ppm-8 hour TWA with a short term exposure limit (STEL) of 150ppm for any 15 minute excursion.

Effects of Overexposure

Acute: Irritant and central nervous system depressant. Inhalation can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, unconsciousness and even death in confined or poorly ventilated areas. Fatalities following severe acute exposure have been attributed to ventricular fibrillation resulting in cardiac failures.[3]

Liquid splashed in the eye can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Chronic: Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. Trichloroethylene has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia in multiple species and biological test specimens. Recent reviews of these data by the Science Advisory Board to EPA's carcinogen assessment group concluded that there was no evidence to support the carcinogenicity of Trichloroethylene. There is no documented evidence that Trichloroethylene causes an increased cancer incidence in humans.

## EMERGENCY AND FIRST AID PROCEDURES:

**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

**Eye or Skin Contact:** Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

**Ingestion:** If conscious, drink a quart of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital or physician. DO NOT give anything by mouth to an unconscious person.

**Notes to Physician (Including Antidotes):** NEVER administer adrenalin following trichloroethylene overexposure. Increased sensitivity of the heart to adrenalin may be caused by overexposure to trichloroethylene.

## SECTION 6 · REACTIVITY DATA

| | |
|---|---|
| **Stability:** Stable | **Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arcs. |
| **Hazardous Polymerization:** Will not occur | **Conditions to Avoid:** None |

**Incompatibility (Materials to Avoid):** Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed.

**Hazardous Decomposition Products:** Hydrogen chloride and possibly traces of phosgene.

## SECTION 7 · SPILL OR LEAK PROCEDURES

**Steps to be Taken if Material is Spilled or Released:** Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

**Waste Disposal Method:** Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility.[7] Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act and all relevant state or local laws/regulations regarding disposal.

## SECTION 8 · SPECIAL PROTECTION INFORMATION

**Respiratory Protection:** For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection. In other circumstances involving potential overexposures, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer). Respiratory protection program must be in accordance with 29CFR 1910.134.

**Ventilation (Type):** Mechanical (General) - Sufficient to maintain workplace concentration below permissible exposure limits.

**Eye Protection:** Splashproof goggles

**Gloves:** Polyethylene, neoprene or polyvinyl alcohol.

**Other Protective Equipment:** Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

## SECTION 9 · SPECIAL PRECAUTIONS

**Precautions to be Taken During Handling and Storing:**

- Do not use in poorly ventilated or confined spaces.
- Trichloroethylene vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with trichloroethylene.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.

**Other Precautions:**

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to trichloroethylene in work area at or below OSHA permissible exposure limits (8-hour TWA - 100 ppm; ceiling - 200 ppm; maximum peak - 300 ppm, 5 minutes in every 2 hours). Observance of lower limits (outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

## References:


1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F. A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N. I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Metabolisms of Industrial Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casarett and Doull, 1975
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980


## Comments:



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